

THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims

1. (Previously Presented) A method of microwave assisted chemical analysis comprising,

providing a sample within a vessel,

heating said sample by microwave energy to volatilize at least a portion of said sample to establish a gas phase with the remainder of said sample being unvolatilized,

cooling said gas phase while continuing to heat said sample by said microwave energy, and

after removal of at least a portion of said gas phase from said unvolatilized portion of said sample analyzing the unvolatilized portion of said sample to determine the composition of said unvolatilized portion of said sample to determine the composition of said unvolatilized portion.

2. (Previously Presented) The method of claim 1 including

employing a sample containing silicon, and

said unvolatilized portion including trace elements which were contained in said silicon containing sample.

3. (Previously Presented) The method of claim 2 including

determining the identity and quantity of at least some of said trace elements

4. (Previously Presented) The method of claim 1 including performing said method in a closed vessel.

5. (Previously Presented) The method of claim 1 including withdrawing at least a portion of said gas from said vessel.

6. (Previously Presented) The method of claim 1 including employing a vessel which has portions which are transparent to microwave energy.

7. (Previously Presented) The method of claim 2 including employing polycrystalline silicon as said sample.

8. (Previously Presented) The method of claim 2 including employing a vessel with at least two compartments in communication with each other,
introducing a silicon containing sample and a first acid into a first compartment,
and
introducing a second acid into a second compartment.

9. (Previously Presented) The method of claim 8 including
employing nitric acid as said first acid, and
employing hydrofluoric acid as said second acid.

10. (Previously Presented) The method of claim 9 including distilling said hydrofluoric acid out of said second compartment and into said first compartment, and
distilling SiF_4 out of said first compartment and into said second compartment.

11. (Previously Presented) The method of claim 1 including employing microwave energy of a frequency of about 27 to 2450 megahertz.

12. (Previously Presented) The method of claim 11 including employing a vessel composed of a fluoropolymer.

13. (Currently Amended) The method of claim 1 wherein said vessel has ~~as~~ a unitary chamber.

14. (Previously Presented) The method of claim 1 including during said heating process introducing additional sample into said vessel.

15. (Previously Presented) The method of claim 14 wherein said method is a continuous process.

16. (Previously Presented) The method of claim 1 including employing a liquid as a sample.

17. (Previously Presented) The method of claim 8 including during said method introducing additional sample into the vessel.

18. (Previously Presented) The method of claim 17 including during said method withdrawing at least a portion of said gas phase from said vessel.

19. (Previously Presented) The method of claim 2 including effecting substantially complete retention in said unvolatilized portion of all of said trace elements.

20-42. (Cancelled).